

PCT/SE98/01982

PATENT CLAIMS

1. Threaded implant (3) for obtaining reliable an-  
choring in bone substance (1), preferably in the  
jaw-bone, in the human body, the bone substance be-  
ing provided with a hole (2) in whose side wall  
10 (2b) it is possible to establish an internal  
threading (1a) which can cooperate with an external  
threading (3d, 3d') on the implant for reliable an-  
choring and healing-in of the implant in the bone  
substance, characterized in that the implant  
15 threading is arranged, particularly in the case of  
soft bone substance, to force the bone substance  
out in essentially radial directions (R) as a func-  
tion of the extent to which the implant is screwed  
into the hole, that the implant threading has a  
20 slight conicity which extends along most or part of  
the length (L) of the implant and which cooperates  
with a circular cylindrical hole (2) in the bone  
(1) to effect greater forcing out of the bone sub-  
stance at the outer parts (2c) of the hole than at  
25 the inner parts (2d) of the hole, the degree of  
forcing out being adapted in relation to the soft-  
ness of the bone substance in order to achieve the  
reliable anchoring, and that said conical threading  
comprises two or more thread spirals (thread en-  
tries) which, despite shortening the time for  
30 screwing the implant into the hole, provide a tight  
threading which permits effective integration with  
the bone substance during the healing-in process  
and counteracts deformation or breaking-up of fine  
bone trabeculae which surround the hole in the  
35 bone.

2. Implant according to claim 1, characterized in  
that the implant threading is arranged to ensure

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that the pressure ( $P$ ,  $P'$ ) between the bone substance and the implant has essentially a constant or slightly increasing value during the greater part of the operation of screwing the implant into the hole.

a 3. Implant according to claim 1 ~~or 2~~, characterized in that the front portion (tip) (3a) of the implant is designed with a conical thread (3e) which has a conicity essentially exceeding the conicity of the slightly conical thread (3d).

15 4. Implant according to claim 3, characterized in that the conicity of the slightly conical thread is chosen between 0.1 - 0.4 mm or has an angle of inclination ( $\alpha$ ) of about 0,5 - 2°, and/or the thread conicity of the thread at the said portion/tip (3a) is of the order of 0.4 - 0.8 mm or with an angle of inclination ( $\beta$ ) of about 10 - 15°, and the portion/tip has a length or height ( $h$ ) of about 10 - 30% of the length ( $L$ ) of the threaded part of the implant.

25 5. Implant according to claim 1, characterized in that the implant threading along at least part of the longitudinal direction of the implant is given a noncircular or eccentric configuration (8a-8i) for the purpose of obtaining improved rotational stability of the implant in the recently inserted state or the incorporated state of the implant in soft/weak bone.

35 6. Implant according to claim 5, characterized in that the implant is arranged with a minimum diameter ( $D'$ ) which corresponds to or is slightly greater, for example 1 - 5% greater, than the diameter ( $d$ ) of the hole.

a 7. Implant according to claim 1 ~~or any of claims 5-~~  
-6, characterized in that the tip or the free end of  
the implant has a circular or concentric thread  
(3e) which merges gradually into a non-circular or  
5 eccentric thread on the remaining part or parts of  
the implant.

a 8. Implant according to claim 1 ~~or any of claims 5-~~  
-7, characterized in that the peripheris of the dif-  
10 ferent non-circular or eccentric thread cross-  
sections have bevelled corners (12) in order to  
avoid sharp corners.

a B 9. Implant according to claim 1 ~~or any of claims 5-~~  
15 -8, characterized in that the non-circularity is ar-  
ranged such that areas of maximum diameter are dis-  
placed in the peripheral direction from one thread  
turn (10) to the next thread turn (11).

20 10. Implant according to claim 1, characterized in  
that the number of thread spirals/thread entries is  
two, three or four.

25 11. Implant according to claim 10, characterized  
in that the number of thread spirals/thread entries  
is adapted to the number of cutting edges (5a, 5b,  
5c, 5d) so that symmetrical cutting forces are ob-  
tained.

a 30 12. Implant according to claim 10 ~~or 11~~, character-  
ized in that two thread spirals are arranged on the  
implant together with two or four cutting edges, or  
in that three thread spirals are arranged together  
with three cutting edges, etc.

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